BLM WRFO DIURNAL RAPTOR SURVEY PROTOCOL (03/19/11)

1. SURVEY TECHNIQUES

It is understood that it is the responsibility of the surveyor to provide accurate raptor survey products. Furthermore, it is the responsibility of the third-party contractor to ensure that all surveyors have adequate field experience performing raptor surveys for the species most likely encountered in each project area. As such, field staff conducting raptor surveys will possess a thorough understanding of raptor survey techniques, advanced raptor field identification skills, and familiarity with conducting raptor surveys in Pinion-juniper woodlands.

All raptor nests (e.g., stick-built structures, nest cavities, eyries), regardless of their breeding or non-breeding season status, are to be reported to WRFO Natural Resource Specialist, Brett Smithers (see contact information below) via phone or by email (preferred) within 24 hrs of the observation.

Please provide the following when reporting nests: 1. the species observed using the nest, if applicable; 2. UTM coordinates for the nest (recorded in NAD83, Zone 12); 3. the date the nest was first documented; 4. brief summary describing adult and/or juvenile behavior and number of nestlings observed, if applicable; 5. project name and NEPA document number, if known; and 6. a photo of the nest.

All raptor surveys will be performed following methods and procedures described in the WRFO Diurnal Raptor Survey Protocol. The third-party contractor responsible for conducting raptor surveys associated with the proposed action will contact the WRFO and request the most current version of the WRFO Diurnal Raptor Survey Protocol prior to performing surveys.

Prompt submission of all survey findings is recommended as spot-checking for nest location accuracy and correct species identification may be performed by WRFO wildlife staff prior to final acceptance of reports. Failure to provide prompt notification of active raptor nests and the requested survey products (see below) may delay the authorization of proposed actions associated with the survey(s), and limit opportunities to develop effective alternatives. In addition, the WRFO may request additional survey information prior to acceptance of the report.

Pedestrian surveys: The primary goal of the raptor survey is to locate and map all active and inactive cliff, ground, and woodland raptor nest structures in areas potentially influenced by project-related activities. The survey technique must include systematic ground searches (e.g., pedestrian inventories) of woodland habitats associated with the proposed action. The area surveyed will extend a minimum 300 meters from the edge of disturbance (i.e., outside margins of cut and fill slopes on proposed access roads and proposed well pads, and outside edges of construction right-of-way width on utility and pipeline corridors). A ¼ mile buffer should be used for cliff sites. Special status species (e.g., Bald eagle) may require a larger search area buffer. Because thorough detection and coverage in woodland and forested habitats does not generally allow greater than 25 m coverage on either side of the observer, pedestrian survey transects should be spaced no more than 50 m from each other (see Figure 1).

Call-playback surveys: Call-playback techniques will be used in conjunction with pedestrian survey methods from 15 May through 15 August using the Kennedy-Stahlecker-Rinker method (see Appendix A). Between 16 August and 14 May, pedestrian surveys only will be used.

2. IDENTIFYING SURVEY AREAS

It is preferable to pre-define potential nesting habitat using aerial photographs (e.g., NAIP imagery) and terrain information (e.g., Digital Elevation Model (DEM) data), where tree density, canopy cover, and the influence of slope and aspect can be assessed to design more efficient and thorough woodland raptor inventory projects. Survey transects will be oriented to bisect as much potential nesting habitat as possible.

3. DETERMINING ACTIVITY STATUS OF NESTS

Nest status confirmation: If the applicant chooses to survey for raptor nests outside of the breeding season (i.e., from August 16 to May 31) additional nest surveys will be required to verify the breeding season status of the nest (e.g., active, inactive, or unknown). In order to consider any exception or modification request to perform project-related activities within either No Surface Occupancy (NSO) or seasonal Timing Limitation (TL) buffers, the breeding season status of each known woodland raptor nest that may be affected by the proposed activity must be confirmed. Nesting activity status in the WRFO Resource Area may most reliably be confirmed between May 15 and August 15 of the current breeding season. Moreover, raptor survey report findings are considered valid for the current (i.e., first) and second subsequent breeding season in which the nest was reported.

If necessary, all nest structures will be viewed from three angles using binoculars or spotting scope. The observer will note the condition of the nest and will document signs of activity (e.g., one or both adult birds present, nestling or fledgling observed in the nest or in the nest area, fresh greenery in nest, down on perimeter of nest or in branches adjacent to nest). In addition, behavioral observations that may be used to help determine nest status will be noted (e.g., adult in incubating posture on nest, aggressiveness of adults to observer(s), etc.).

If there is enough information to conclusively determine if a nest is active (see above), the observer will record the necessary information and leave the area as soon as practicable to reduce stress to adults and/or juvenile birds. The final determination of the breeding season status of the nest will be performed by a BLM biologist. As noted above, all active nests will be reported within 24 hours of the observation. The surveyor will not mark the area, nest tree or route to the nest. Moreover, the nest tree will not be climbed to assess number of eggs laid, number of young hatched, number of young depredated, etc.

If a raptor is heard or seen during the call-playback sequence, the surveyor will cease broadcasting and record the bearing of the detected raptor. If the raptor is detected aurally, the surveyor will mentally note the approximate distance the bird was first aurally detected. The surveyor will then move in the direction of the call or visual observation and GPS the approximate location where the call or visual observation was detected. This area will be intensively surveyed for active and/or alternate nests. Generally, a 31 acre circular area with radius of 200 m and centered on the approximate location where the raptor was first seen or heard is intensively surveyed for nest structures. Single and multi-person crews should maintain a maximum distance of 20 m between tracks when spiraling out from the anchor point.

4. SURVEY PRODUCTS

The following will be submitted with each written report:

1. An ESRI shapefile in the UTM, NAD83, Zone 12 geographic coordinate system that depicts nest locations, call-playback stations, GPS tracks for routes walked during surveys, project features (e.g., roads, pipelines, well pads, etc.), if available, and survey area polygons will be provided with the written report on compact disk (CD) (Figure 6). The shapefile for the call playback attribute table will include

the call playback station number (STATION), the Datum (DATUM), the x and y UTM coordinates (X_COORD, Y_COORD), the time when the first call was played at the call playback station, the approximate distance to the raptor (DIST) reported in meters, the type of detection (D_TYPE) (e.g., **V** for visual, **A** for aural, **AV** for aural and visual, **F** for feather, and **ND** for no detection), the species of raptor detected, if applicable (SPP), the habitat ranking (RANK) (e.g., Excellent, Good, Poor) (See Figure 3), and whether or not an occupied and/or unoccupied nest(s) were found (NEST) (e.g., Yes, No) (Figure 2).

2. The surveyor(s) will provide general characterization of the nest stand, and information will be collected within a 1.9 acre circular area with radius of 50 m that extends out from the base of the nest tree. The following components of the nest stand will be described (Figure 1):

- Tree composition (i.e., a brief description of the dominant tree species present in the nest stand)
- Stand age (e.g., young, mature, or old-growth)
- Presence and abundance of large woody debris
- Canopy cover and height (i.e., percent canopy cover within the nest stand, and mean height of all trees within the nest stand)
- Vegetative ground cover (i.e., percent shrub and herbaceous cover)
- Areal extent and continuity of the nest stand
- Slope position (e.g., upper third, middle third, lower third) and topographic character (e.g., "nest tree is located on middle third of slope on mid-slope bench"), if applicable.
- Percent slope at the nest tree
- Slope aspect (in degrees) at the nest tree
- Elevation (in feet) at nest tree
- Nest tree species
- Nest tree DBH (in inches)
- Nest tree height (in feet)
- Nest height (in feet)
- Shortest distance to the edge of the woodland stand or clearing and the nest tree

3. Distances from existing and proposed anthropogenic and natural features (i.e., roads and trails, pipeline/fenceline corridors, well pad perimeter, etc.) pertinent to impact assessment will be recorded on the BLM raptor inventory form. If appropriate, describe intervening terrain or vegetation features that may modify aural or visual detection from the nest.

4. The observer will take pictures of the nest and nest area. The observer will take: 1) one close-up photo of his or her GPS with UTM coordinates clearly displayed (Figure 4); 2) one photo of the nest tree with the nest in the frame; 3) one close-up photo of the nest; and 4) one representative photo of the nest stand.

5. If possible, determine species associated with inactive sites based on material size, nest dimensions, and relative position in crown or from trunk. Description of the nest (i.e., nest dimensions, material size, position in tree) will be noted on the inventory form, as necessary.

6. Collection of production data or nest phenology information is not required. The survey objective is to locate active and inactive nest structures, and determine nest occupancy status (e.g., active, inactive, or unknown status) using descriptive, non invasive methods as described under "DETERMINING ACTIVITY STATUS OF NESTS", while minimizing the duration and intensity of disturbance to adult, nestling, or fledgling raptors. As noted above, climbing the nest tree, taking pictures of nest contents, or marking of nest trees, nest stand, or route to the nest is not authorized for purposes of these surveys.

7. The following forms will be submitted with the written report: 1. Nest Inventory Form (Figure 1); and, 2. Raptor detection table (Figure 2). The Nest Inventory Form will be completed for each nest structure or eyrie found during surveys. The written report will include information summarizing the project area, survey methods, species observed, number of nest structures found, acres of suitable nest habitat surveyed, equipment used, and any additional information relevant to the project area or survey results. In addition, photos will be included in the written report (see Item 4). Topographic maps (1:24,000 scale) showing nest locations will also be included in the written report. The written report shall be submitted electronically as a .pdf or Microsoft Word file to WRFO Natural Resource Specialist, Brett Smithers.

Questions related to report submission, report content or purpose should be directed to:

Brett Smithers
BLM, White River Field Office
220 East Market Street
Meeker, Colorado 81641
Phone: (970) 878-3818 Email: brett_smithers@blm.gov

Appendices: Appendix A: BLM-WRFO WOODLAND RAPTOR BROADCAST SURVEY PROTOCOL

Figures:
Figure 1. WRFO Nest Inventory Form (version 5/10/10).
Figure 2. An example attribute table for the call playback information.
Figure 3. Example images of "Excellent" and "Good" nesting habitat.
Figure 4. Representative photos that will be taken at each occupied, unoccupied and at nests where the breeding season status was not confirmed.
Figure 5. Generalized figure that shows broadcast and pedestrian transect spacing, and spacing of broadcast stations.
Figure 6. Generalized figure that shows the spatial data that must be included with the written report.

5. REFERENCES

Kennedy, P.L. and D.W. Stahlecker. 1993. Responsiveness of nesting northern goshawks to taped broadcasts of 3 conspecific calls. Journal of Wildlife Management 57: 249-257.

Geissler, P.H. and M.R. Fuller. 1986. Estimation of the proportion of an area occupied by an animal species. Survey Research Methods Section, pages 533 - 537 in Proc. Amer. Statistical Assoc.

Iverson, G.C. and M.R. Fuller. 1991. Woodland nesting raptor survey techniques. Pp. 118 - 124 in Proc. Midwest Raptor Management Symposium and Workshop. National Wildlife Federation, Washington D.C.

Mosher, J.A., M.R. Fuller, and M. Kopeny. 1990. Surveying woodland raptors by broadcast of conspecific vocalizations. J. Field Ornithol. 61:453 - 461.

Mosher, J.A. and M.R. Fuller. 1996. Surveying woodland hawks with broadcasts of great horned owl vocalization. Wildl. Soc. Bull. 24:531-536.

McLeod, M.A. and D.E. Andersen. 1998. Red-shouldered hawk broadcast surveys: factors affecting detection of responses and population trends. *Journal of Wildlife Management* 62:1384-1396.

Appendix A

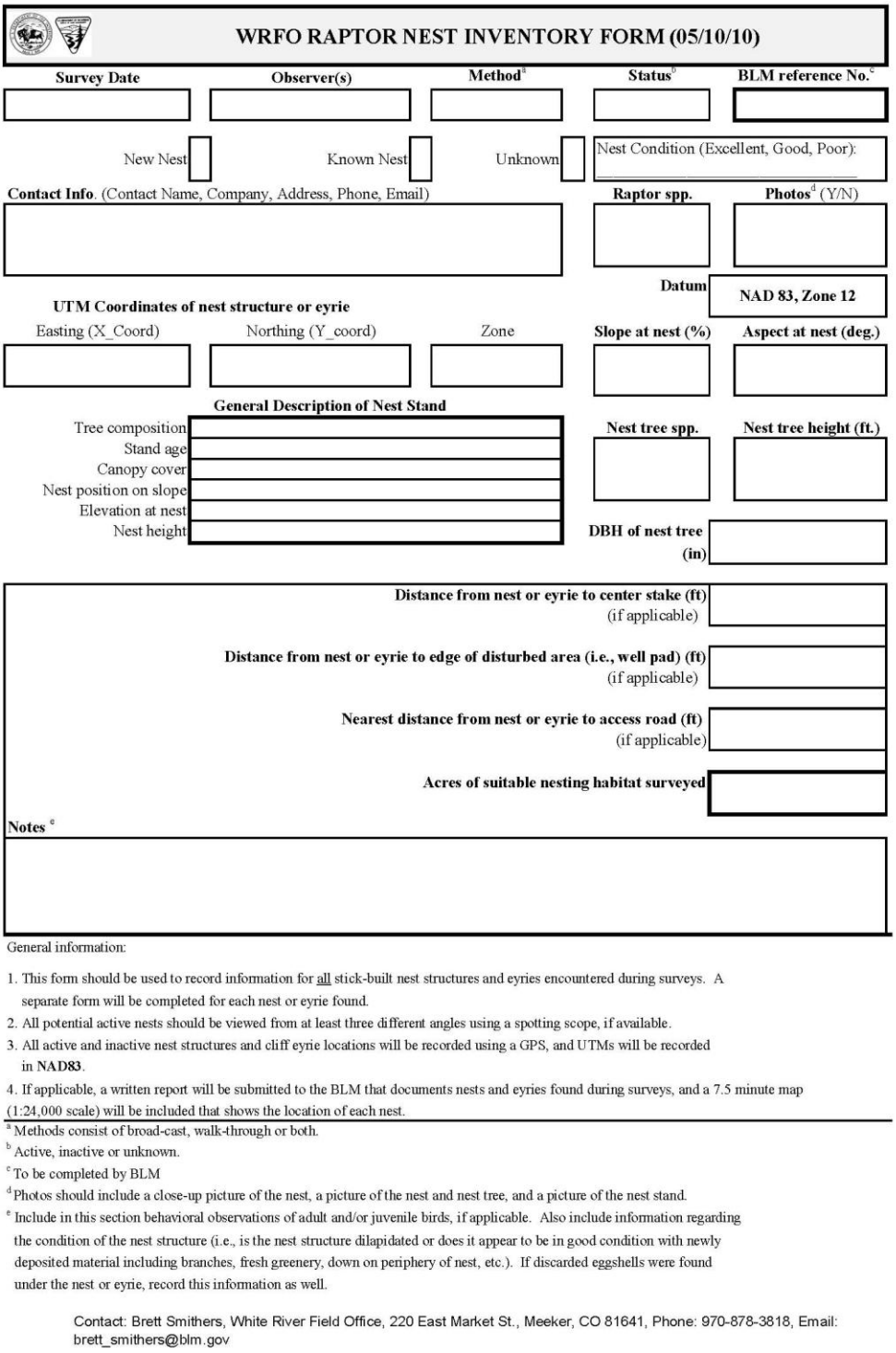
BLM-WRFO WOODLAND RAPTOR CALL-PLAYBACK SURVEY PROTOCOL

TIMING

Call-playback techniques will be used in conjunction with pedestrian surveys from 15 May through 15 August.

SPACING OF CALL-PLAYBACK STATIONS AND TRANSECTS

1. Transects will be spaced **250** meters from each other, and survey stations will be separated by a distance of **200** meters (see Figure 1).
2. An adult Cooper's hawk alarm call will be used at all call-playback stations. If requested, a CD will be provided by WRFO to the surveyor.
3. At each calling station, broadcast at **60** degrees from the transect line for **10** seconds, then listen and watch for **30** seconds. Repeat this sequence two more times, rotating **120** degrees from the last broadcast. Repeat the three-call sequence again. After the last sequence, move to the next station. Move (walk) between stations at an easy pace, listening and watching carefully for raptor calls and signs. The majority of time will be spent walking between stations, so it is important to be alert for raptors approaching, often silently, to investigate the surveyor. Do not survey from vehicles or use vehicles to move between stations. Moreover, off-road vehicle travel is not authorized for purposes of conducting raptor surveys. Use of two observers will likely enhance the probability of visual detections of woodland raptors; however, experienced surveyors may conduct surveys singly.
4. Effective coverage of a survey area depends on the surveyor's ability to broadcast sound that can be detected at least **200** meters from the source. The equipment used to broadcast the call should produce **100-110** dB output at one meter from the source. Regardless of the type of equipment used, broadcast calls should be audible at least **200** meters from the calling station.
5. Surveys can begin ½ hour before sunrise and can cease ½ hour before sunset.
6. To avoid misidentifying broadcasts of coworkers, simultaneous surveys should be conducted no closer than two transect widths apart.
7. Surveys should not be conducted in high winds (i.e., wind speed ≥ **15** mph) or in heavy rain.



WRFO RAPTOR NEST INVENTORY FORM (05/10/10)

Survey Date	Observer(s)	Method[a]	Status[b]	BLM reference No.[c]

New Nest ☐ Known Nest ☐ Unknown ☐ Nest Condition (Excellent, Good, Poor):

Contact Info. (Contact Name, Company, Address, Phone, Email)

Raptor spp.	Photos[d] (Y/N)

Datum NAD 83, Zone 12

UTM Coordinates of nest structure or eyrie

Easting (X_Coord)	Northing (Y_coord)	Zone	Slope at nest (%)	Aspect at nest (deg.)

General Description of Nest Stand

Tree composition	
Stand age	
Canopy cover	
Nest position on slope	
Elevation at nest	
Nest height	

Nest tree spp.	Nest tree height (ft.)

DBH of nest tree (in)

Distance from nest or eyrie to center stake (ft) (if applicable)

Distance from nest or eyrie to edge of disturbed area (i.e., well pad) (ft) (if applicable)

Nearest distance from nest or eyrie to access road (ft) (if applicable)

Acres of suitable nesting habitat surveyed

Notes [e]

General information:

1. This form should be used to record information for all stick-built nest structures and eyries encountered during surveys. A separate form will be completed for each nest or eyrie found.
2. All potential active nests should be viewed from at least three different angles using a spotting scope, if available.
3. All active and inactive nest structures and cliff eyrie locations will be recorded using a GPS, and UTMs will be recorded in **NAD83**.
4. If applicable, a written report will be submitted to the BLM that documents nests and eyries found during surveys, and a 7.5 minute map (1:24,000 scale) will be included that shows the location of each nest.

[a] Methods consist of broad-cast, walk-through or both.
[b] Active, inactive or unknown.
[c] To be completed by BLM
[d] Photos should include a close-up picture of the nest, a picture of the nest and nest tree, and a picture of the nest stand.
[e] Include in this section behavioral observations of adult and/or juvenile birds, if applicable. Also include information regarding the condition of the nest structure (i.e., is the nest structure dilapidated or does it appear to be in good condition with newly deposited material including branches, fresh greenery, down on periphery of nest, etc.). If discarded eggshells were found under the nest or eyrie, record this information as well.

Contact: Brett Smithers, White River Field Office, 220 East Market St., Meeker, CO 81641, Phone: 970-878-3818, Email: brett_smithers@blm.gov

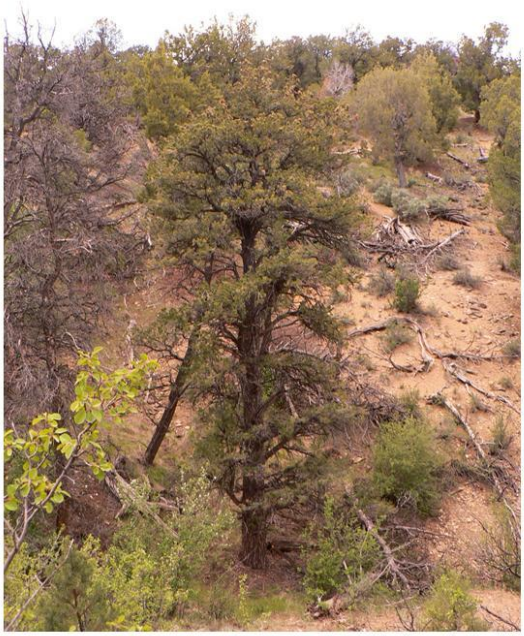
Figure 1. WRFO Nest Inventory Form (version 5/10/10). This form should be used to document all nest structures or eyries found durring surveys regardless of their breeding season status.

STATION	DATUM	ZONE	X_COORD	Y_COORD	TIME	DIST (meters)	D_TYPE	SPP	RANK	NEST
10001	NAD83	12	774562	4456588	12:05	250	V	Coopers hawk	Excellent	No
10002	NAD83	12	774545	4456556	12:15		ND			
10003	NAD83	12	778954	4565847	12:45		ND			
10004	NAD83	12	778956	4589574	13:15	300	A	Unknown	Good	No
10005	NAD83	12	778659	4689574	13:36	150	A	Coopers hawk	Poor	Yes

Figure 2. The figure above shows the attributes to be included in the call playback attribute table. The call playback attribute table will include the call playback station number (STATION), the Datum (DATUM), the x and y UTM coordinates (X_COORD, Y_COORD), the time when the first call was played at the call playback station, the approximate distance to the raptor (DIST) reported in meters, the type of detection (D_TYPE) (e.g., **V** for visual, **A** for aural, **AV** for aural and visual, **F** for feather, and **ND** for no detection), the species of raptor detected, if applicable (SPP), the habitat ranking (RANK) (e.g., Excellent, Good, Poor) (See Figure 3), and whether or not an occupied and/or unoccupied nest(s) were found (NEST) (e.g., Yes, No).

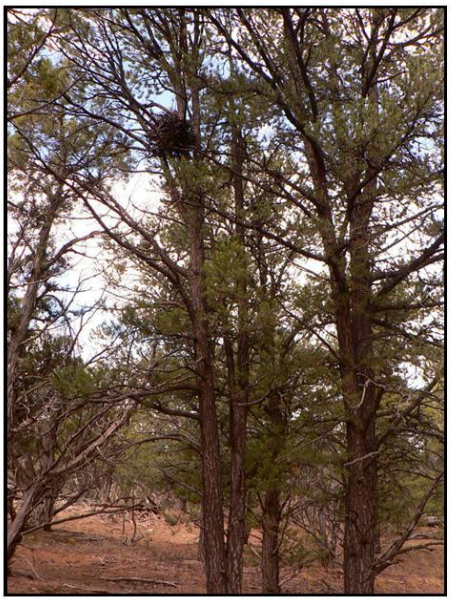
The images on this page are representative photos of nesting habitat that falls within the "Excellent" category.

Figure 3. The above images (and images on the following page) show examples of excellent and good woodland raptor nesting habitat. For *excellent* habitat within 100 m of the call playback station, the topography should be relatively flat with a northerly aspect, the age of the stand should be mature with the majority of trees falling within the >16 inch DBH class, the majority of trees > 35 feet in height, and the canopy should be relatively closed. For *good* habitat, the majority of trees within 100 m of the call playback station may be younger and may fall within the <16 inch DBH class, and the trees may be, on average, from 20 to 25 feet in height. In addition, canopy closure may be more open, and percent slope may be higher. For *poor* habitat within 100 m of the call playback station, canopy closure will be low, with distance between trees >50 m. *Poor* habitat most often includes those areas where Pinion-juniper is encroaching into sagebrush parks. These areas are dominated by sagebrush, perennial grasses, and possibly mountain shrubs at higher elevations. These areas are also not considered as woodland habitat.



The images on this page are representative photos of nesting habitat that falls within the "Good" category.

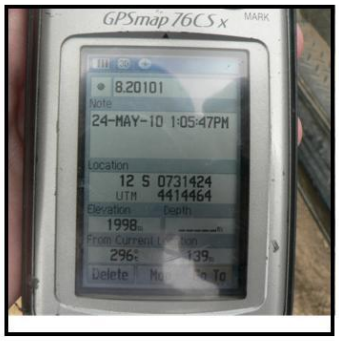
Figure 3. Continued.



The above image is an example photo of the nest tree. Ideally, this photo should include the entire nest tree.

The above image is an example photo of the nest. These photos are used to confirm the overall condition of the nest.

The surveyor will also take a picture that accurately illustrates tree composition, which includes dominant tree species, tree height, tree density, canopy closure and DBH.



The surveyor will also take a picture of his or her GPS to ensure that the UTM coordinates that are recorded on the nest inventory form are correct.

Figure 4. The above image shows representative photos that will be taken at each occupied and unoccupied nest. In addition, photos will be taken at nests where the breeding season status was not confirmed.

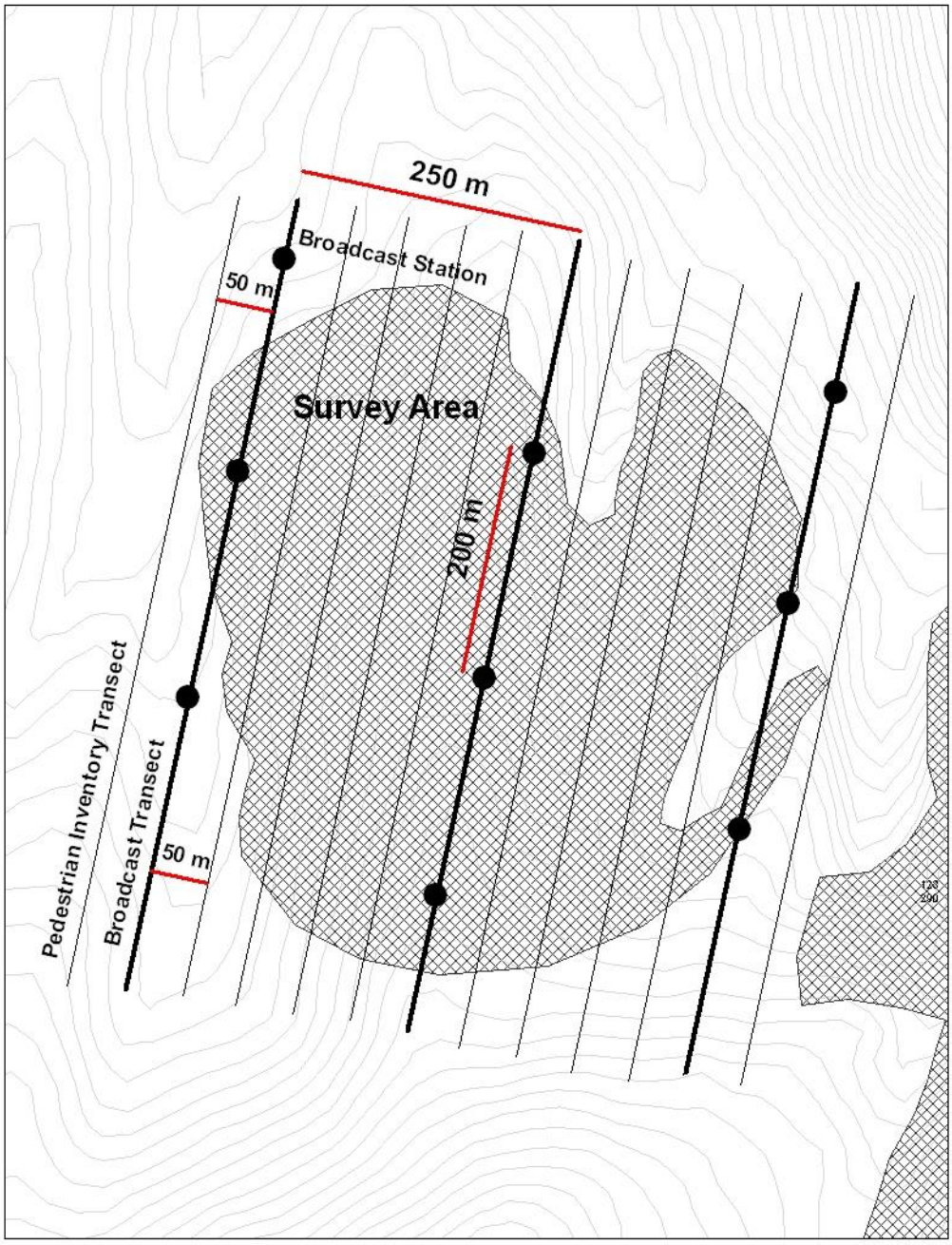


Figure 5. Generalized figure that shows broadcast and pedestrian transect spacing, and spacing of broadcast stations. In this example, the survey area corresponds to potential nesting habitat. Broadcast survey stations are spaced at 200 m intervals, and broadcast transects are separated by 250 m. Pedestrian transects should be separated by 50 m to ensure adequate coverage. For broadcast methods see Appendix A.

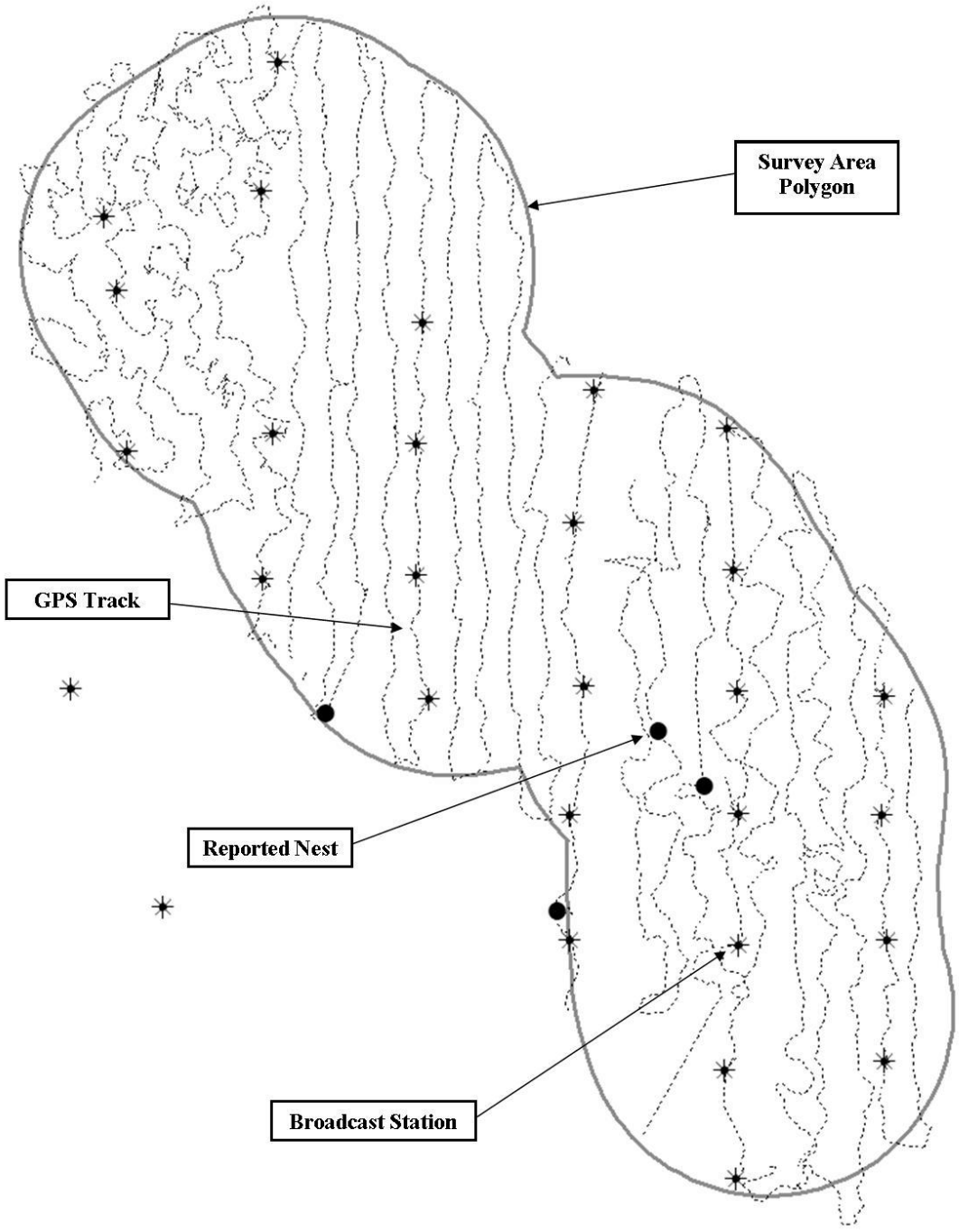


Figure 6. The above image illustrates the type of geospatial data that should be collected and submitted with the written report. The 4 features include the survey area polygon, broadcast stations, GPS tracks, and all nests that were identified in the written report.